

forming a cavity. The cavity is empty. Lambuth does not disclose that the central cavity is filled with corrugated cardboard/paper.

Furthermore Lambuth does not disclose that the upper and lower flanges are formed of plywood. In Col 6 lines 3 to 7, it is stated that the flange members comprise either solid lumber of multiply veneers all having the veneer grain direction extending parallel with each other as in MICROLAM flanges. MICROLAM is further described in Col 1 lines 25 to 30.

We enclose a print out from "About: Home renovations" website based in the US, ENCLOSURE (C). The page is entitled "What is Microlam". The Examiner can see that "Microlam" is also known as LVL (Laminated Veneer Lumber and Glulam.

We also enclose a Glossary of Engineering Wood terms, ENCLOSURE (D), produced by the American Plywood Association (APA) on its website.

The Examiner can see that LVL is produced by bonding thin layers of wood veneer together. The grain of ALL the veneers being in PARALLEL.

Glulam is defined as an engineering timber in which individual length of timber are glued end to end and the lengths are then face bonded to form straight beams. Again the grain in the timbers will all be extending substantially lengthways of the beam.

By contrast PLYWOOD is defined as veneers arranged in perpendicular layers.

We also enclose a print out from Wikipedia, (ENCLOSURE (E)). Plywood is defined again as being made from plies or veneers so that direction of the grain differing in neighboring plies is 90°.

It is submitted that if the world's largest encyclopedia, and the APA both define Plywood as having wood layers in which the alternate layers are perpendicular, then the definition given in the American Heritage Concise Dictionary is wrong. Be that as it

may, we have now defined plywood in Claim 15 as being formed from mutually perpendicular adjacent plies.

These different engineering woods have different engineering properties that can be tested and specified and the Examiner will appreciate Plywood is a different material to MICROLAM. In plywood, adjacent veneers of wood are orientated cross-wise. This produces a dimensionally stable laminate of uniform strength.

The advantage of Plywood over the parallel grained LVL (of which MICROLAM is an example) lies in the fact that LVL is anisotropic (that is its physical properties are directional) whereas the plywood is substantially homogeneous so that beams made in accordance with the present invention are generally stiffer and stronger.

It is furthermore submitted that the present I-beam, having plywood flanges and a web formed from two spaced apart plywood sidewalls is not obvious. We enclose a copy of the American Plywood Associations web site on I Joists. It can be seen that all the commercially available joists comprise flanges of sawn lumber or structural composite lumber and a plywood or OSB flange. It is noteworthy that the APA differentiates between the use of plywood as in the flange, and the use of structural composite. The implication is that plywood and structural composite are different materials (see the glossary of terms).

Plywood has been in the public domain since World War II, and I-Beams disclosed in Lambuth have been known since 1983 and yet no other person, including members of the APA, who design and sell I-Joists and composite wooden beams, has to-date produced an I-beam having the combination of plywood flanges and a web comprising plywood sidewalls. It is the use of plywood that allows the flanges of the present invention to be so thin, 6mm for the present examples whereas the flanges shown in Lambuth are considerably thicker. In Lambuth the flange width W_f is stated as being

about 1.5 inches (about 38mm) (Col 4 line 42). By viewing the drawings it can be seen

Even in Fig.4, the flange thickness is considerable.

It is the use of plywood flanges that allows the present applicant to produce a very light beam which is extremely rigid. The beams shown in Lambuth are much heavier having flanges of up to 38mm in thickness. As a consequence the present I-beams are easier to handle on site and panels produced using such beams are also easy to handle.

As previously argued Grigsby (5681 641) does not disclose an I beam, but does disclose a cardboard billet or strut having a central cavity filled with corrugated cardboard adhered to the surrounding cavity walls. However the main objective of Grigsby is to replace wood (col 3 lines 9-11) with wood substitute member (col 4 lines 45-47). The present applicant uses a corrugated cardboard core not to create a wood substitute but to enhance the strength of his plywood I-beam.

Even if Grigsby and Lambuth are considered as documents that can be properly associated, albeit that they are in totally different search classes both, International Classes B73B & E04C respectively and US Classes 428/182 and 52/729, this does not invalidate the present inventive concept of a I-beam having thin plywood flanges and a web formed from plywood sidewalls with a corrugated paper/cardboard core.

As can be seen from Lambuth (1983) and the present APA website,, the progress and design changes in field of wooden composite I-beams or joists in the last 23 years are negligible. Given this background the present invention is a distinct leap forward, which cannot be considered obvious given that plywood is used for the webs in Lambuth and is a material which has been in the public domain for at least 60 years. Even Lambuth did not consider the possibility.

It is submitted that the invention as now Claimed in Claim 15 is both novel and inventive, providing an improved beam with good weight/strength characteristics, and

which cannot be derived from a combination of any two cited documents.

Since we believe Claim 15 to be acceptable we submit that the objections raised against the dependant Claims are waived.

Having further amended the specification and claims, it is now believed that the application is in condition for allowance and such action is respectfully requested. If the Examiner still feels that there are some minor matter which need to be resolved, Applicant's attorney would welcome a call from the Examiner at the below listed phone number.

Respectfully submitted,


Attorney for Applicant

Paul E Milliken
9061 Wall Street, NW
Massillon, OH 44646-1676

Phone: (330) 830-1555
Fax: (330) 830-0266

Encl

Certificate of Transmittal

I hereby certify that this correspondence is being facsimile transmitted to the US Patent and Trademark Office (Fax number (571) 273-8300) on February 28, 2007.

Paul E Milliken

Signature

